IN THE CLAIMS

1. (Presently Amended) A multi-channel, optical switch to use light bullets as optical pulses, the switch comprising:

a waveguide of a first material;

a plurality of channels extending from the waveguide, each channel of the plurality of channels to provide an optical path suitable for transmission of the light bullets, each channel formed of a material other than the first material;

and wherein a first subset of the light bullets are to propagate into a predetermined channel of the plurality of channels responsive to interaction with a second subset of the light bullets;

a plurality of light source channels extending from the waveguide, each light source channel to provide an optical path suitable for transmission of light bullets; and

a light source connected to the plurality of light source channels, the light source to provide the second subset of light bullets, the light source being a single source of light.

2 – 5. (Cancelled)

6. (Original) The switch of claim 1, wherein:

the light bullets are to co-propagate through and interact within the waveguide to selectively direct the light bullets.

7. (Original) The switch of claim 1, further comprising:
an absorption layer extending from the waveguide, the absorption layer to absorb light bullets.

8. (Original) The switch of claim 1, further comprising:
a controller coupled to the waveguide and coupled to the plurality of channels, the controller to control operation of the waveguide and the plurality of channels.

9. (Original) The switch of claim 8, wherein:
the channels of the plurality of channels may be selectively disabled from transmitting light bullets; and
the controller to selectively disable the channels of the plurality of channels on an individual or group basis.

10. (Cancelled)

11. (Previously presented) The switch of claim 8, wherein:
the controller is to control the light source, the controller to set a power level of the light source, the power level of the light source corresponding to an intensity of the light bullets produced by the light source.

12. (Previously presented) The switch of claim 8, further comprising:
a system interface coupled to the controller.

13. (Original) The switch of claim 12, further comprising:
a cable interface coupled to a channel of the plurality of channels.

14. (Original) The switch of claim 1, wherein:
the first material is a semiconductor material.

15. (Previously presented) The switch of claim 14, wherein:
the semiconductor material is composed essentially from a material selected from the group consisting of Gallium Arsenide (GaAs) Indium Phosphide (InP), and Gallium Nitride (GaN).

16 – 21. (Cancelled)

22. (Original) The switch of claim 1, wherein:
the waveguide includes a single planar, rectangularly shaped slab of semiconductor material.

23. (Original) The switch of claim 1, wherein:
the first material is bulk material to provide the light bullets with other directions of propagation, including directions of propagation out of the plane of the waveguide.

24. (Original) The switch of claim 1, wherein:
the light bullets propagate along corresponding travel paths; and
the travel paths are selectively determined by controlling the timing, intensity, and the axial displacement of the light bullets relative to each other.

25. (Original) The switch of claim 1, wherein:
the first material is a semiconductor material having a sufficiently negative group velocity dispersion and high nonlinear index of refraction to support the light bullets.

26. (Presently amended) A method of switching optical data comprising:
receiving a light bullet in a first optical channel, the first optical channel formed of a first material;
injecting the light bullet into a waveguide, the waveguide formed of a second material different from the first material;
directing the light bullet within the waveguide responsive to a guiding light bullet generated by a single source of light; and
receiving the light bullet in a predetermined second optical channel.

27. (Original) The method of claim 26, further comprising:
injecting the guiding light bullet into the waveguide.

28 – 36. (Cancelled)

37. (Presently amended) A router, comprising:

a plurality of input ports;

a plurality of output ports;

a switching fabric coupled to the input ports of the plurality of input ports and coupled to the output ports of the plurality of output ports, the switching fabric including a plurality of interconnected multi-channel, optical switches, each of the optical switches to use light bullets as optical pulses, each of the optical switches including:

a waveguide of a first material;

a plurality of channels extending from the waveguide, each channel of the plurality of channels to provide an optical path suitable for transmission of the light bullets, each channel formed of a material other than the first material;

wherein a first subset of the light bullets are to propagate into a predetermined channel of the plurality of channels responsive to interaction with a second subset of the light bullets, the second set of light bullets being generated by a single source of light;

and wherein the optical switches of the plurality of optical switches are coupled together through the channels of the plurality of channels of each optical switch.

38 – 41. (Cancelled)

42. (Presently Amended) A switching fabric to switch light bullets between a set of input ports and a set of output ports, comprising:

a plurality of interconnected multi-channel, optical switches, each of the optical switches to use light bullets as optical pulses, each of the optical switches including:

a waveguide of a first material;

a plurality of channels extending from the waveguide, each channel of the plurality of channels to provide an optical path suitable for

transmission of the light bullets, each channel formed of a material other than the first material;

wherein a first subset of the light bullets are to propagate into a predetermined channel of the plurality of channels responsive to interaction with a second subset of the light bullets generated by a single source of light;

and wherein the optical switches of the plurality of optical switches are coupled together through the channels of the plurality of channels of each optical switch.

43 – 44. (Cancelled)